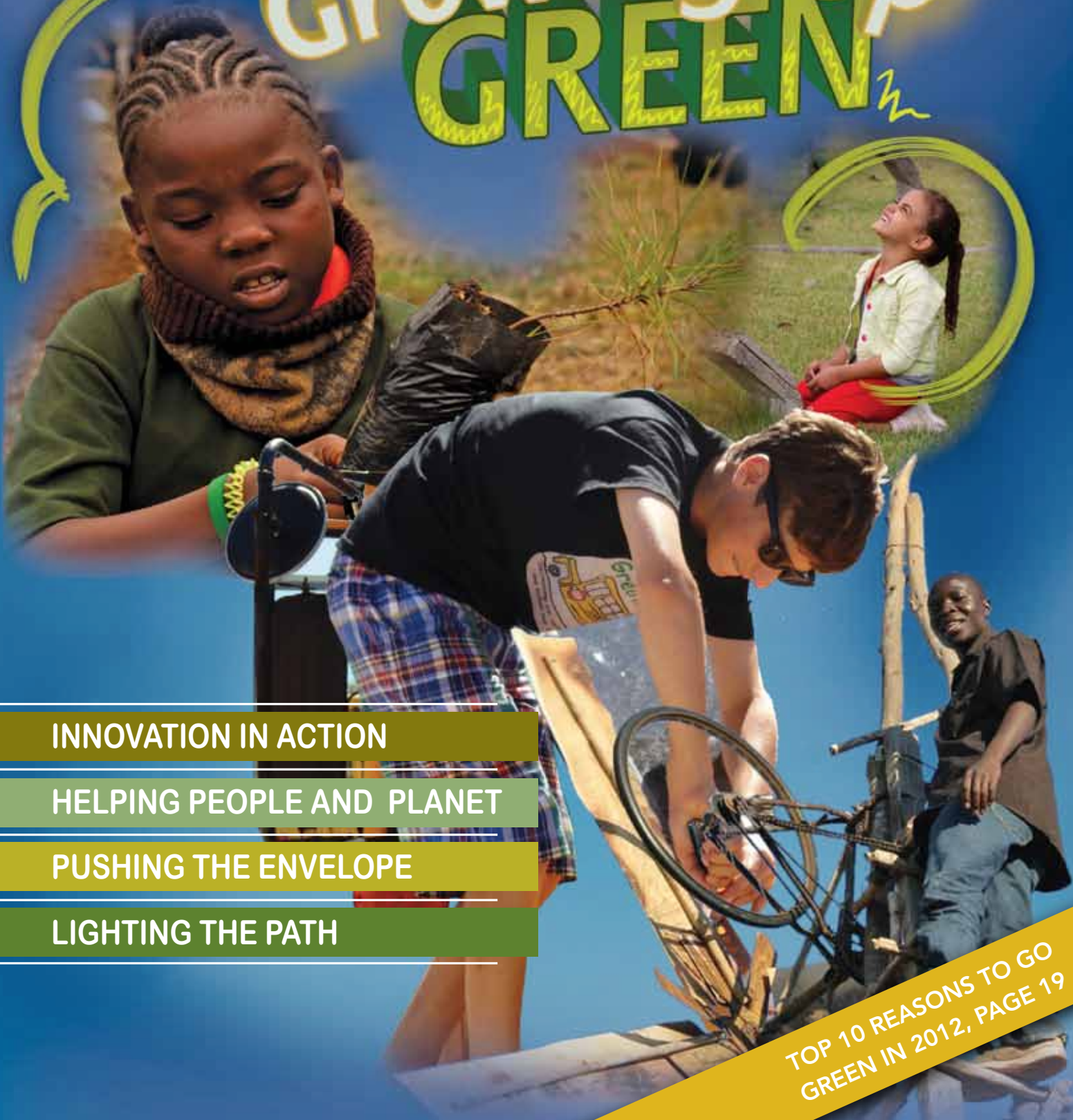




# Growing Up GREEN



INNOVATION IN ACTION

HELPING PEOPLE AND PLANET

PUSHING THE ENVELOPE

LIGHTING THE PATH

TOP 10 REASONS TO GO  
GREEN IN 2012, PAGE 19



U.S. DEPARTMENT OF STATE  
VOLUME 16 / NUMBER 7

Published April 2012

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The Bureau of International Information  
Programs of the U.S. Department of State  
publishes *eJournal USA*. Each issue examines  
a major topic facing the United States and  
the international community, and informs  
international readers about U.S. society,  
values, thought, and institutions.

Each *eJournal* is published in English,  
followed by electronic versions in French,  
Portuguese, Russian and Spanish.  
Selected editions also appear in Arabic,  
Chinese and Persian. Each journal is  
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## ABOUT THIS ISSUE

*"I am only a child, yet I know we are all in this together  
and should act as one single world toward one single goal."*

Severn Cullis-Suzuki, 12, 1992 Rio Earth Summit



©AP Images



Courtesy photo/Ashoka's Youth Venture

Spell it out: Kids use their hands to spell "change" for Youth Venture, a group  
that helps young people create organizations.

In 1992, representatives from 172 nations — including 108 heads of state  
— and more than 24,000 representatives from nongovernmental organiza-  
tions gathered in Rio de Janeiro for the first United Nations Conference on  
Environment and Development, or Rio Earth Summit. Of all the speeches  
delivered over the course of the 11-day conference, one voice rose above the  
rest: that of 12-year-old Severn Suzuki of Canada.

Now known as "the girl who silenced the world for five minutes," Suzuki ad-  
dressed delegates from around the world in an impassioned speech entreating  
world leaders to protect the Earth and its people. Suzuki urged everyone to  
follow the creed of sustainable development: to live and grow in a way that  
preserves the environment and ensures that future generations will be able to  
enjoy both the Earth's natural resources and a high standard of living.

Since Suzuki's speech, youth activism in the field of sustainable development  
has continued to grow. More than half the world's population is currently  
younger than 25, with even higher percentages of youth living in developing  
countries. Millions of young people are making it clear that they do not want  
to inherit or pass on a world threatened by climate change, poverty and illness.  
Instead, they are using their creativity, energy and persistence to set the world  
on a more sustainable path.

This issue of *eJournal USA* explores how young people are leading the way to a  
cleaner, greener, more sustainable future. From launching their own environ-  
mental organizations to developing alternative energy resources, today's youth  
have what it takes to make the world a better place.

# GROWING UP GREEN

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Youth are leading the way to a sustainable future by creating innovative solutions to global problems.

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Front cover photos: Kendra Helmer and Ben Edwards/USAID (left); ©AP Images/Andre Penner (top right); Courtesy of GreenShields (center); ©Tom Rielly (bottom right) Back cover photo: ©AP Images

# YOUTH TODAY LEAD TODAY



*By Astrid Nicole Ng*

One of the most common phrases that we, as young people, hear growing up is “Today’s youth are tomorrow’s leaders.” This saying is meant to inspire us and motivate us to be our best. It reminds us that the choices we make today will eventually impact us, our community and the world.

Fortunately, we do not have to wait to see the impact youth can have on our world. In fact, I think we should change this slogan to “Youth today lead today, and tomorrow, and ... well, every day.”

Attention! Mariana Peneva of European Green Youth demonstrates with an “Earth Protecting Area” sign at the Brandenburg Gate in Berlin, Germany.

I have seen the influence we have on our world firsthand through my work for the My Community, Our Earth (MyCOE) initiative. This program was created in preparation for the 2002 World Summit on Sustainable Development in Johannesburg, South Africa. Over the past decade, more than 500 youth-led, community-based, sustainable development projects have been launched in fields such as climate change, green economy, food security and hazards and vulnerability. Our MyCOE team provides youth around the world with information and tools from the field of geography, and guides them in creating sustainable solutions for their communities.



Sing it loud! A youth chorus greets participants during the opening ceremonies of the 2002 World Summit on Sustainable Development in Johannesburg, South Africa.

This program has changed youths' lives in many ways. Young people have received scholarships, been appointed environmental leaders in their communities, and guided their governments to take new environmental preservation measures.

How can young people make a difference? By connecting with each other. By overcoming our differences. By uniting to create innovative solutions to problems we face as global citizens of this planet. Today, communication technologies such as mobile phones, mapping applications and social-networking software make global relationships possible. We can connect across borders with the click of a mouse. Online mapping tools help us visualize our global problems more clearly and guide us in developing solutions.

Currently, I am working on a MyCOE virtual exchange program funded by the U.S. Department of State. It connects high school students in Bolivia, Ghana, Nicaragua, the Philippines and the United States via social

networking sites and videoconferencing software. I help these students share their personal stories about sustainable development — what they can do, have done, and are currently doing. I guide them as they work together to confront sustainable development issues, and help them understand what it means to be a global citizen. Although we are all from different countries and speak different languages, we are facing these global issues together. We are working as a team. The world is changing in different ways in different places. If we understand how the world is changing in other parts of the world, we can learn to solve our own issues at home.

Youth participation in events like Rio+20 is crucial because we offer fresh eyes, active minds and open hearts. We are not so set in our ways that we shut others out. We are willing to be inspired by what others have to say. We are firm about our beliefs, yet we allow for new ideas and opinions to mold us. We bring fresh, new ideas that older generations may think of as being

“idealistic.”

We understand that optimism is important when the problems we face are so grim. We have the energy to fight for issues that are important to us.

This being said, young people also have challenges to overcome. Some of us don't realize the impact that we can have, so we don't get involved. We don't voice our opinions. We think that we are too young to make a real difference. We are not experienced enough to make the connection between what we believe is “our world” versus “the world.” We must bridge these worlds and recognize them as one and the same. We must use the tools available to us to our advantage.

If I could say one thing to people my age, I would say: we must be present at Rio+20. We must be

**500**

**GREEN  
PROJECTS**

**launched by kids  
in the last**

**10  
YEARS**

Kendra Helmer and Ben Edwards/USAID



Starting fresh: A young girl plants a pine seedling in Haiti's Parc National La Visite. In the last decade, young people have launched more than 500 green projects.

©AP Images/The Hawk Eye/John Lovetta



Pick it up! Young people like 10-year-old Kelsea Gaul are acting to create a cleaner environment.

Courtesy of IISD/Earth Negotiations Bulletin



Youth speak out! Kate Offerdahl calls for sustainable chemical alternatives as a youth representative at the 19th U.N. Commission on Sustainable Development in 2011.

engaged. We must be aware. We must commit ourselves to tackling these issues head-on. Why? Because we are the leaders of today! As we grow up, we will learn life lessons that will help us be even better leaders tomorrow. But time isn't on our side. Let's work together as leaders today, so that we can develop solutions that will help us tomorrow. Let's make sure we continue working for sustainable development every day. ■



*Astrid Nicole Ng, 23, is a research assistant for the Association of American Geographers (AAG), which serves as the Secretariat of the My Community, Our Earth (MyCOE) partnership program ([www.mycoe.org](http://www.mycoe.org)). Originally from California, Ng currently resides in Panama, where she facilitates online networking and exchanges for several youth-related AAG projects. In her free time, she enjoys dancing, reading and spending time with her friends and family.*



Visit the MyCOE website for more info!  
<http://goo.gl/P2DLC>

*The opinions expressed in this article do not necessarily reflect the views or policies of the U.S. government.*

A group of Vietnamese students are riding bicycles in a parade. They are wearing red headbands with the text "150 VIETNAM" and holding red flags. The text "Y SUSTAINABLE SOCIETIES START WITH OUTH" is overlaid on the image.

# Y SUSTAINABLE SOCIETIES START WITH OUTH

Ready to ride: Vietnamese students bike in the 2009 International Day of Climate Action parade. Many young people support sustainable development by advocating for change.

©AP Images/Chitose Suzuki



©AP Images /Enid News & Eagle/Billy Hefton

In 2011, the world's population exceeded 7 billion. That figure is expected to rise to 9 billion by the middle of the 21<sup>st</sup> century. As more children survive to adulthood and people live longer, the Earth's resources are strained. We are challenged to learn new ways to live so that future generations have the same benefits as we do.

"Sustainable development" may be the key to meeting the needs of the present, without making it more difficult for future generations to meet their own needs. Everyone should be able to live life to the fullest — to grow healthy, wealthy and wise — without damaging the environment or taking away anyone's ability to live well, whether now or in the future.

## STRENGTH IN TAKING ACTION

More than half of all people alive today are under the age of 25. In developing countries, the percentage of young people can be as high as 85 percent. But their strength comes from more than numbers.

Millions of young people are making it clear that they don't want to inherit or pass on a world threatened by climate change, poverty and illness. Instead, they are using their creativity, energy and persistence to create a better balance between economic growth and environmental stewardship.

One of the many ways young people are ensuring a sustainable future is to become advocates for change.

One young woman in Indonesia, Adeline Tiffanie Suwana, 15, offers a good example. At age 10, she started her own environmental organization called *Sahabat Alam*, or "friends of nature" in Indonesian. Five years later, Suwana's organization has nearly 2,000 members from across Indonesia. She has been internationally recognized and honored for her outstanding advocacy efforts. Her work includes everything from running an award-winning website to producing her own song and television program. (See p. 11.) In addition to their education and advocacy work, members of *Sahabat Alam* put their words into action by cleaning up beaches and planting coral reefs and mangroves.

## TRAINING FOR A GREENER FUTURE

One way young people are discovering ways to find sustainable solutions is through education. To succeed as entrepreneurs and innovators in a sustainable society, today's youth must develop knowledge and skills in areas such as science, technology, engineering and mathematics. With these tools, ideas that were once unthinkable become possible.

Take for example the team of four American University students in Sharjah in the United Arab Emirates who figured out how to turn noise into energy. The team decided to explore an alternative energy source that very few people had considered. Their results are astounding. (See p. 14.)

Extraordinary innovation doesn't need to be extraordinarily complicated. One determined student in rural India created a device that can produce light from a tractor engine. (See p. 15.) A teenager from Malawi built a windmill from spare junkyard parts. (See p. 13.)

## HELPING PEOPLE, PROTECTING EARTH

Young people are also proving that it is possible to help others and preserve the planet at the same time. A group of American teenagers launched a program that provides warmth to families in need, and also recycles discarded cooking oil in the process. (See p. 8.) In Mexico, a team of young entrepreneurs launched a ride-sharing company because they were inspired by their desire to do something good for their country. (See p. 10.)

Youth also understand that sustainable development is not a luxury, it is a necessity. It does not need to come with a luxury price tag. An energy entrepreneur in Kenya developed a solar cooker that enables people in rural areas to cook without having to search for firewood or produce carbon-laden smoke — for only \$5. (See p. 18.)

Belgian university students demonstrated that sustainability is not only affordable, but attractive too. Their award-winning solar energy house is called the E-Cube. The house shows how energy efficiency can meet electrifying design to provide sleek, high-tech solutions for zero-carbon living. (See p. 16.)

## BUILDING A BETTER TOMORROW, TODAY

It is critical for youth to become involved in sustainable development, so that the dream of a greener future with opportunities and resources for all can become a reality. The environmental, economic and social challenges we face today require not only international cooperation, but also individual initiative — and young people have the ability to bring about both. Today's youth will be tomorrow's leaders. As many have already shown, it is never too soon to start leading. ■

— Ashley Rainey Donahay

## DID YOU KNOW?

**Y**outh have been participating in international climate negotiations since the first Rio Earth Summit in 1992. In 2009, the United Nations officially recognized youth as stakeholders at international climate change conventions. That year, 1,500 young people participated in the 15th Conference of the Parties (COP 15) in Copenhagen, Denmark. The number of youth advocates at conventions has been increasing ever since. This year marks the 20th anniversary of the Rio Earth Summit. The U.N. Conference on Sustainable Development in Rio de Janeiro (commonly called Rio+20) has created the Conference of Youth for Rio+20 (aka YOUTH BLAST) where more than 2,000 young people are expected to attend.

**Facing page:** Don't hold me back! Kelsey Crowley holds a Monarch butterfly as part of a migration-tracking program in Kansas. Young people work to balance development and the environment.

**This page:** Growing up green together: Young Brazilians learn about native Amazon trees as part of a national curriculum that teaches schoolchildren sustainable ideas and habits.



Watch Adora Svitak, 12, explain why "childish" thinking can be a good thing!  
<http://goo.gl/u0cbO>

©AP Images/Andre Penner

  
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# COOKING OIL



# FROM WASTE TO WARMTH

By Jane Morse

Americans love their fried food. Every year in the United States, billions of gallons of cooking oil are used to fry favorite dishes. The result is billions of gallons of difficult-to-discard grease is left behind. Many restaurants pay private companies to dispose of their discarded oil, but a pioneering group of teenagers in Rhode Island has come up with a way to use that grease in a positive way.

In 2008, five middle-school students from Westerly, Rhode Island, launched Project TGIF (Turning Grease into Fuel). They found a way to convert discarded cooking oil into fuel, which they then donate to heat needy families' homes. The students worked with Westerly's town council to provide collection containers. Now local restaurants and residents are able to donate their cooking oil for recycling.

One of TGIF's partners is called Grease Co. It picks up the cooking oil from the collection containers and delivers it to biodiesel refineries. There, it is recycled into fuel. The fuel is then distributed to charitable agencies and families needing heating assistance.

To date, Project TGIF has produced more than 30,000 gallons (113,562 liters) of biodiesel a year — worth approximately \$60,000 — and offset the release of nearly 600,000 pounds (272,155 kilograms) of carbon dioxide into the atmosphere. The students have donated more than 14,000 gallons (53,000 liters) of recycled oil to local charities and helped 144 families with emergency heating assistance.

The Turning Grease into Fuel project has won recognition on both state and national levels — most

notably winning a 2009 President's Environmental Youth Award. Since 1971, this award has recognized young Americans for protecting the nation's air, water and land.

One of TGIF's founders, 13-year-old Cassandra Lin, has been recognized by the United Nations Environment Programme (UNEP) for her environmental activism. She will be among 1,400 youth delegates at the 2012 United Nations Conference on Sustainable Development in Rio de Janeiro. Lin is particularly proud that her project helps both people and the environment. "I want to make an impact," Lin told UNEP. "It doesn't matter how big or small you are, anyone can make a difference!" ■

*Jane Morse is a staff writer with the U.S. State Department's Bureau of International Information Programs.*

**Facing page:** Waste not, want not: (Left to right) Mark Walker, Miles Temel, Vanessa Bertsch, Marissa Chiaradio, Taylor Fiore-Chettiar and Cassandra Lin help convert used cooking oil into energy. **Right:** Now accepting offers! (Left to right) Cassandra Lin, Vanessa Bertsch, Taylor Fiore-Chettiar, John Perino and Miles Temel set up recycling drums at a local festival for food vendors to recycle used oil.

Watch the TGIF team explain how their project works!  
<http://goo.gl/82XtG>



Photos courtesy of Westerly Innovation Network





# SHARING A RIDE REDUCES TRAFFIC AND POLLUTION

By Jane Morse

Palacios and team members, Anibal Abarca, Alberto Padilla, Federico Alatrisme and Ignacio Cordero, first met to discuss their ideas for a ride-sharing project in August 2010. By January 2011, they were serving their first clients.

The ride-sharing service has proven to be very popular in cities such as Mexico City. Drivers there spend an average of two hours a day in their cars. *Aventones* has already begun offering their services in Chile and hopes to expand to busy cities across Latin America.

*Aventones* founders have won several awards for their innovative and environmentally friendly business. Their awards include a 2011 e-business award from the Talent and Innovation Competition of the Americas and a 2011 “Go Green!” World Summit Youth Award. ■

*Jane Morse is a staff writer with the U.S. State Department's Bureau of International Information Programs.*

**Top:** Can we get a ride? Young entrepreneurs, Cristina Palacios and Ignacio Cordero, encourage Mexican commuters to share rides and save the environment with their company *Aventones*.



Visit the *Aventones* website for more information!  
<http://goo.gl/BWuRV>

“Less traffic, lower emissions, better cities” — that’s the mantra of *Aventones* (“Rides”). *Aventones* is an online ride-sharing company based in Mexico.

*Aventones* was founded by five young Mexican entrepreneurs to encourage “carpooling” in their city. The organization provides an online service that links commuters who need transportation with individuals who can provide it. Members register by creating a profile in the company’s network, where they offer or request shared transportation. Online software matches compatible commuters and suggests where they should meet.

*Aventones*’ founders — all between the ages of 25 and 30 — wanted to launch a business that would raise environmental awareness. They also wanted to improve the quality of life in Mexico. “I always had the desire to do something to improve my country,” said Cristina Palacios, one the company’s founders. “That is why *Aventones* was born.”

# INDONESIA'S SAHABAT ALAM, PROTECTING THE EARTH

By Lauren Monsen

**A**deline Tiffanie Suwana understands the importance of environmental protection in her native country. The 15-year-old from Indonesia witnessed terrible flooding in her country's capital city, Jakarta, caused in part by erosion and climate change.

In 2008, when she was not quite 11, she decided to do something about it. During a school holiday, Suwana organized a gathering of almost 150 school-aged friends to plant mangroves. These trees prevent damage from hurricanes and tsunamis.

Since that first event, she has recruited more students to tackle environmental issues. She has invited young people throughout Indonesia to form a community called *Sahabat Alam* (Friends of Nature).

In the Pulau Pramuka area of Indonesia, Suwana and other members

of *Sahabat Alam* planted coral reefs to replace the damaged reefs surrounding the island. The group has also helped with fish breeding, turtle protection and tree planting.

*Sahabat Alam* is based in Jakarta. It's now an internationally recognized nonprofit group that has won numerous awards for its conservation projects.

Suwana has done many things to encourage people to protect the Earth. She presented her ideas to schools and government agencies. She produced a television program about conservation and also recorded a song (in English and Indonesian).

As a spokeswoman for *Sahabat Alam* and a role model for youth, Suwana is living proof that one person can make a difference.

The United Nations Environment Programme's International Children and Youth Conference was

held in 2011 in Indonesia. At the conference, Suwana said: "As children, we

can plant trees [and] clean rivers and beaches, but we cannot stop industries from polluting our rivers; we cannot force them to adopt a green economy. We want policies and laws that will make industries sustainable."

Suwana won the grand prize of the Malaysia-China Chamber of Commerce (MCCC) Golden Green Award in 2011. Her efforts through *Sahabat Alam* earned her the award and a cash prize of \$6,000. She told MCCC officials: "With our small hands, we can make a difference. I hope to reach out to youths worldwide so we can contribute our ideas on how to conserve the environment." ■

*Lauren Monsen is a staff writer with the U.S. State Department's Bureau of International Information Programs.*

**Top:** Follow me! Adeline Suwana proudly waves the Indonesian flag at the 2010 Children and Youth International "Let's Take Care of the Planet" Conference in Brazil.  
**Left:** We're rich! *Sahabat Alam* partners with local schools to plant coral reefs in Indonesia, the second richest country on Earth for biodiversity, after Brazil.



Photos courtesy of Sahabat Alam

Watch Suwana's video "Our Small Hands Against Climate Change"! <http://goo.gl/P4tkY>



# GREENSHIELDS CLEARS THE AIR, BOOSTS EDUCATION

By Mary-Katherine Ream

Every weekday in the United States, nearly 480,000 buses transport more than 26 million children to and from school. Sharing transportation helps protect the environment by limiting carbon dioxide emissions. However, some old school buses can create a lot of pollution. Is there a way to make them more “green?”

That is the question Jonny Cohen asked himself one afternoon as he was walking home from school. Noticing the clunky body of a school bus, Cohen, then 11, wondered if he could create a more streamlined bus.

Cohen came up with the idea of attaching shields to the fronts of buses to redirect airflow. To test his idea, he launched GreenShields, a project to install plastic panels on buses to make them more aerodynamic and energy efficient.

“The focus of GreenShields is to save gas for schools so they have more money for education and to help decrease pollution by using gas more efficiently,” said Cohen.

With the help of his older sister Azza and his friends, Cohen won a \$1,000 Youth Venture grant from Ashoka — a global organization that supports social entrepreneurs.

**Top:** Cutting edge: Jonny Cohen’s Green Shields project attracted volunteers from schools such as MIT and Northwestern, including Manny Casro, Steve Jacobson and Juan Perez. **Below:** Get to work! GreenShields inventor Jonny Cohen attaches a clear screen to the front of a school bus. By improving aerodynamics, the shields make buses more fuel- and cost-efficient.

Cohen’s team used the funds to build a wind tunnel for testing prototypes. In 2010, the team refined the concept and won a \$25,000 Pepsi Refresh Grant.

Impressed by GreenShields’ success, John Benish, a bus company owner in Illinois, donated a school bus to the team, and recruited a group of Northwestern University engineering students to help them refine the project.

During a recent test run in Joliet, Illinois, the shield generated a 28 percent reduction in fuel consumption. According to some estimates, that reduction could save U.S. schools more than \$600 million a year.

This year, Cohen will represent Illinois in the 2012 Prudential Spirit of Community Awards. This national program recognizes outstanding acts of youth volunteerism.

“My goal is to give this technology to every school district in the United States,” says Cohen, “but I also hope to inspire kids that any idea they have can become something if they try.” ■

*Mary-Katherine Ream is an intern with the U.S. State Department’s Bureau of International Information Programs.*

Visit the GreenShields website for more information!  
<http://goo.gl/ApNnD>



Courtesy of GreenShields/Natalie Sereda

Courtesy of GreenShields



# BUILDING WINDMILLS BY CANDLELIGHT

By Louise Fenner



Photos: Tom Rielly

At age 15, William Kamkwamba scoured a junkyard in his remote village of Wimbe, Malawi.

Kamkwamba's family had no running water or electricity. Family members spent two hours a day hauling water, and used paraffin candles for light. He had dropped out of secondary school because his family could not afford the fees. He continued his education by spending his days in a library. This is where he found the books that would literally change his life, including one with a picture of windmills on the cover.

"I didn't read English well, so I mainly taught myself these things by studying the pictures and diagrams," Kamkwamba said in his blog. Kamkwamba began a blog in 2007, five years after he built his first windmill from discarded pieces of metal and plastic. He used a rusted tractor fan for a rotor, a broken bicycle, plastic pipes and wood. He even made his own hammers, screwdrivers and washers.

The first windmill Kamkwamba built, which was 5 meters (15 feet) tall, produced enough electricity to power several light bulbs and a radio. He since has built two more windmills for his family compound. He also installed a well so that his family can irrigate its garden and grow produce year round.

But Kamkwamba isn't satisfied to help only his family. He aims to improve the lives of everyone in Malawi. Since building his windmills, Kamkwamba has worked on preventing malaria in his community, providing clean water using a solar-powered pump and building a drip irrigation system.

Kamkwamba returned to school and graduated from the African Leadership Academy in Johannesburg, South Africa. After that, he co-authored a book, *The Boy Who Harnessed the Wind*. He has spoken about his experiences at events all over the world, such as the World Economic Forum, TEDGlobal and many others. He inspired a nongovernmental organization called Moving Windmills, which supports rural economic development and education projects in Malawi. The organization helped rebuild Kamkwamba's primary school in Wimbe, which now uses wind and solar power.

Kamkwamba is now a sophomore in engineering at Dartmouth College in Hanover, New Hampshire. He is 24, and wants to start a company that can provide "reliable electricity" to Malawi, especially through renewable energy sources.

"I will try to use my engineering skills to

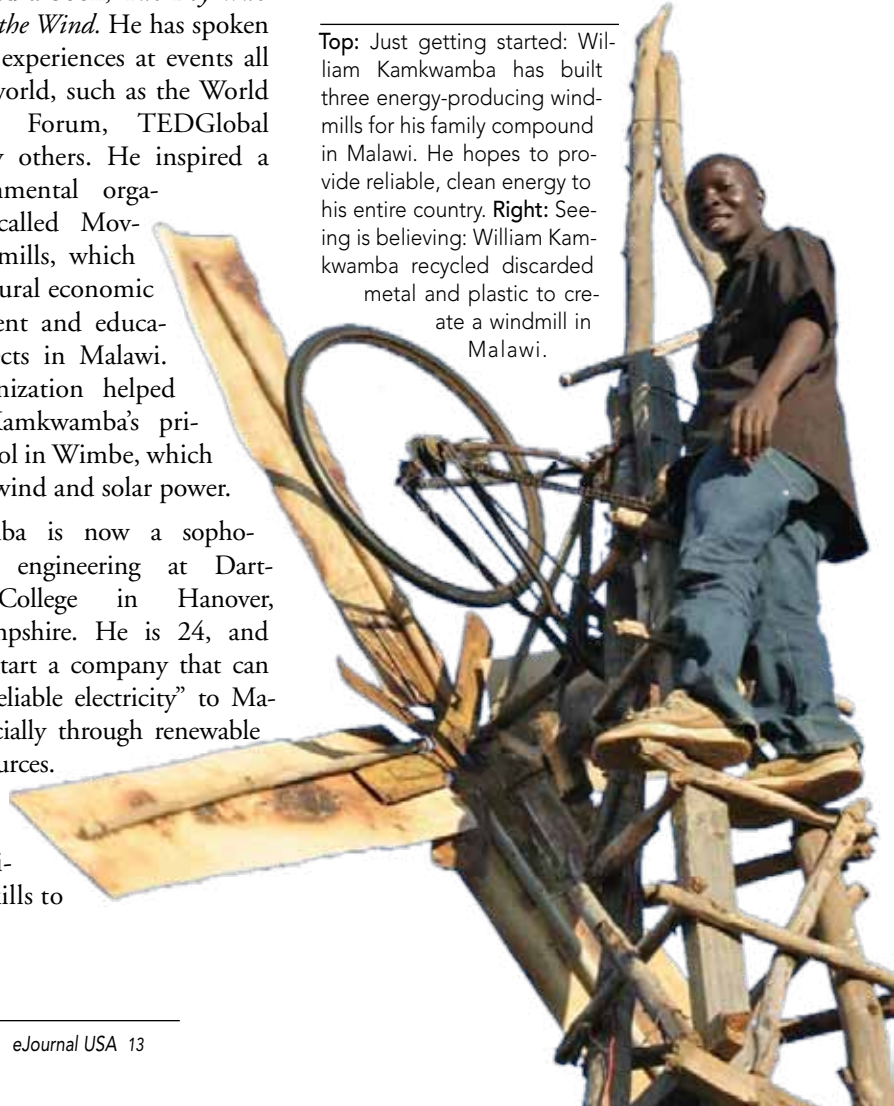
harness wind and sun's power more effectively," he says. Currently, only 2 percent of rural Malawians have electricity. ■

*Louise Fenner is a staff writer with the U.S. State Department's Bureau of International Information Programs.*



Watch to learn more about William's inspirational story!  
<http://goo.gl/ROigg>

**Top:** Just getting started: William Kamkwamba has built three energy-producing windmills for his family compound in Malawi. He hopes to provide reliable, clean energy to his entire country. **Right:** Seeing is believing: William Kamkwamba recycled discarded metal and plastic to create a windmill in Malawi.



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# NOISE GOES ELECTRIC

By Jane Morse



Score one for the environment! Piezoelectric technology converts vibrations into energy, so noise from cheering fans becomes a source of clean, renewable energy.

For most of us, noise produces nothing but headaches. But four students at the American University of Sharjah in the United Arab Emirates have found a way to capture the energy in noise and turn it into electricity.

“People are already developing solar power, wind and geothermal energy and biofuels. We thought, ‘Why not do something unique in an area nobody is working on?’” student Arsalan Mohammad told *Ed Arabia*.

Automobiles, machines, people and animals all create sound and vibrations, which can be captured by materials that generate voltage. Mohammad and fellow students Mohammad Ajmal, Danial Ahmad and Mohammad Ateeq developed a new device with these materials. The device converts mechanical energy, acoustic noise and ultrasonic waves into clean, renewable energy.

These devices are called piezoelectric technology, and they have many potential uses. For example, if they are installed in shoes, they could charge an electronic device such as a mobile phone. If they are put in road bumps, they could capture energy and power surrounding street lights. The roar of the crowd in a packed football

stadium could be used to energize more than the players on the field.

Piezoelectric devices can even capture noise too quiet to be heard by the human ear, such as sounds produced in an aquarium.

Ajmal believes his team’s work might also be used to improve the quality of life for the world’s poor.

The four American University students have been recognized for their innovative work by the Institution of Engineering and Technology (IET). IET is a globally acclaimed professional society for the engineering and technology community.

The students said they were motivated by the global drive to develop alternative forms of renewable and sustainable energy. “If we as youth don’t take the steps right now to contribute to the development of alternative energy, we would be limiting ourselves,” Mohammad told *Ed Arabia*. “Now is the time for youth to step up and put forth their innovative ideas.” ■

*Jane Morse is a staff writer with the U.S. State Department’s Bureau of International Information Programs.*

# LIGHTING UP

## RURAL INNOVATION IN INDIA

By Kathryn McConnell

**S**tudying at night was making Shailesh Upadhyay sick.

In the rural village in Gurera, India, where Upadhyay grew up, electricity was hard to come by. With only a few hours of electricity available during the day, Upadhyay had to study at night by the light of a kerosene lamp.

But Upadhyay had asthma and the kerosene's toxic fumes affected his breathing each night that he studied. He was forced to drop out of school.

Upadhyay was determined not to give up his studies, so he came up with a bright idea: use tractor batteries to power lamps. He designed a circuit board that channels energy from tractor batteries into compact fluorescent lamps, which are more energy-efficient than regular light bulbs.

With the help of his invention, Upadhyay was able to enroll in university and study engineering. When he mentioned his design to classmate Ujala Shanker, who also grew up in Gurera, the two co-founded Tractor-Factor, a venture to light homes in rural villages and help students study longer.

"Like me, many rural students struggle to progress in spite of their intelligence and enthusiasm," Upadhyay told Ashoka, a global organization that supports social entrepreneurs such as Upadhyay.

But their venture had many challenges. Upadhyay and Shanker first had to convince villagers to use the circuit. Many villagers were worried that taking power from a battery would lessen its life. However, they were surprised to learn that the circuit could actually extend battery life when used regularly. Villagers feared they would get a shock when

they plugged in the wires. Through demonstrations, Upadhyay and Shanker showed that at only 12 volts, the gadget is very safe.

Students in Gurera started using Tractor-Factor's circuit. They were able to study longer, and the number of students passing their exams nearly doubled. Some 240,000 fewer liters of carbon dioxide were released into the atmosphere each month.

"Understanding the needs and affordability and fine-tuning the solution are the key," Upadhyay told Ashoka. "Being a good observer helps in identifying the difficulties and simplest ideas that could be of great impact."

Upadhyay and Shanker since have incorporated their idea into a larger project called Stitches, which aims to improve the socio-economic welfare of farmers. So far, they have helped more than 200 people across rural India. Their work has also helped Shanker obtain a fellowship to study for a master's degree at the Goldman School of Public Policy at the University of California, Berkeley. Shanker will be the first person from Gurera to study in the United States. ■

*Kathryn McConnell is a staff writer with the U.S. State Department's Bureau of International Information Programs.*



Courtesy of Stitches



Watch Shailesh and Ujala explain their project!  
<http://goo.gl/KzImA>

# TEAM BELGIUM: **SOLAR** CAN BE AFFORDABLE

*By Karin Rives*



**S**tudents at Belgium's Ghent University decided to do some homework before they designed their solar house for competition in 2011. In September 2009, they traveled to Washington to see for themselves what the Solar Decathlon was all about. As one student put it, they went to "learn some tips and tricks."

The 2011 Solar Decathlon was sponsored by the U.S. Department of Energy. It brought together university teams from around the world in a competition to design, build and operate the most cost-effective, energy-efficient, and attractive solar-powered house.

The houses, displayed at Washington's National Mall, were beautifully designed. They were equipped with sleek,

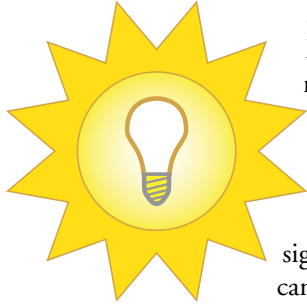
high-tech solutions for modern, zero-carbon living. "Attractive," recalled 24-year-old Ghent University student Michael Arens, but were they built for a mass market?

"The thing that got us all thinking was, 'OK, this is the most energy-efficient house, but who can afford it? So what's the use then?'" Arens said. "Our goal became to prove that it's possible to make a house that is energy efficient and accessible for all kinds of people — as long as they're willing to live a little differently."

The students had intense brainstorming sessions where they developed four alternative designs. They finally settled on the E-Cube, which is a factory-built, "do-it-yourself" kit of a house that meets basic living needs. It does not require expensive materials or finishes. The Ghent University students estimate that their house,

appliances included, will cost a homebuyer about \$268,000 — roughly one-half of what winning Solar Decathlon houses have been priced in the past.

Arens and the three other students on the project merged features from each of their four alternative designs into one. The process was challenging at times. The core team is made up of seven students, and is called Team Belgium. The team has learned the hard way that Belgian building codes don't always accommodate unconventional home design. They're also finding that red tape can slow down students eager to get a project done.



In the end, they were thrilled with the outcome.

The two-story E-Cube (short for Energy Cube) is shaped exactly as it sounds. It measures 8 meters by 8 meters and provides a total living area of exactly 93 square meters — the maximum floor space allowed in the Solar Decathlon. It's a basic, functional two-bedroom house with an open, high ceiling in the central living area that makes the space look bigger than it is.

The cube shape makes the house compact, reducing the surface area exposed to the elements. These efficiencies, together with the lack of “extras” such as wall paint and decorations, help keep it affordable. By mixing “warm” material (wood) with “cold” material (steel), members of Team Belgium say they have given the house a unique and appealing look.

“We didn't want to make something that looked really beautiful or like a traditional house,” Arens said. “Our

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“Our goal became to prove that it's possible to make a house that is energy efficient and accessible for all kinds of people — as long as they're willing to live a little differently.”

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goal was to prove that it's possible to live in a sustainable, energy-efficient house that is affordable — even if you have to live a little differently. I'm really glad that this is the house we ended up with. And in the end, it's the basic, simple design that makes it beautiful.” ■

*Karin Rives is a freelance writer in Washington, D.C.*



Watch this video to learn more about the 2011 Solar Decathlon!  
<http://goo.gl/6pxHK>

**Facing page:** Shine on: Light from Team Belgium's solar house illuminates the night sky in Washington, DC. Belgium's 2011 Solar Decathlon entry proves that energy efficiency can be beautiful. **Inset:** Lounging in the solar house: Visitors relax and chat with the E-Cube's designers. **Below:** It takes a village: University teams from all over the world converge to construct energy-efficient home models for the U.S. Department of Energy's 2011 Solar Decathlon.

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The Kyoto Box, which can boil water and bake food without burning wood, benefits people like these Masai women from Kenya while also reducing deforestation.

**J**on Bøhmer's Kyoto Box started out as a science project with his two young daughters, but it soon turned out to be a major benefit to 3 billion people who struggle to cook their food with clean, renewable energy.

The original Kyoto Box was made with plexiglass and two cardboard boxes. One box was covered with foil and the other was painted black inside. It is capable of boiling water and baking food without the need for firewood. This solar cooker uses the sun, which is a clean and accessible energy source. The Kyoto Box is a major advance in safe, healthy cooking for those who lack access to clean water or firewood.

The use of wood fires for cooking has led to extensive deforestation in many parts of the world — and defor-

# COOKING INSIDE THE BOX

By Mark Trainer

estation is thought to be a major contributor to climate change. In addition, the fumes from primitive home ovens are a major cause of respiratory disease in the developing world. The Kyoto Box, on the other hand, produces no carbon emissions.

Bøhmer is a Norwegian who lives and runs his company in Kenya. He had been researching solar-cooking solutions for a decade, but the first Kyoto cooker came together much more quickly. "This took me about a weekend, and it worked on the first try," Bøhmer told CNN. "It's mind-boggling how simple it is."

The Kyoto Box won \$75,000 in the 2009 FT Climate Change Challenge award, which is run by Forum for the Future and the *Financial Times* newspaper.

The simplicity of the Kyoto Box's design (which has been refined and is now made from recycled plastic) makes it possible to produce each box for just \$5.

"We're saving lives and saving trees," Bøhmer told London's *The Telegraph* newspaper. "I doubt if there is any other technology that can make so much impact for so little money." ■

*Mark Trainer is a staff writer with the U.S. State Department's Bureau of International Information Programs.*

What's in the box? The latest version of the Kyoto Box is made from polypropylene and acrylic glass. Bøhmer's original solar cooker was created with plexiglass, cardboard, foil and black paint.

Watch a video about the benefits of solar cookers!  
<http://goo.gl/XwhXw>



Photos: Courtesy of Kyoto Energy Ltd.

# TOP 10 REASONS TO GO GREEN IN 2012

*By Road to Rio+20*

This is the year for young people around the world to campaign and act on local and global sustainable development issues. Here are 10 very important reasons you should get involved:

## 1 It's your future!

How old will you be in 2050? The choices and actions we take today will shape the world to come — not just for us, but for future generations as well. Do you have what it takes to leave a better world for your children's children?

## 2 Rio+20

Brazil will host an important event even before the World Cup and the Olympic Games in Rio de Janeiro: the U.N. Conference on Sustainable Development (Rio+20). Get involved in sustainable development initiatives now, in the lead-up to this summit. Help inspire world leaders to chart a path to a cleaner, greener future!

## 3 Gain experience, make a difference

Improve your job prospects while improving the world! Work in the field of sustainable development to get valuable hands-on experience, as well as positive karma. Got sustainable development experience on your resume? Awesome!

## 4 Join a growing sector

The world is now working toward a low-carbon future, so more and more green jobs are appearing every day. In Germany alone, the number of jobs in the renewable energy sector is expected to increase by more than 35 percent by 2030 from 2010 levels. Prepare yourself for tomorrow's job market today!

## 5 Any skill can benefit the cause

What are you good at? Your skills are bound to be useful in sustainable development. From conservation, engineering and policy to education, media and research, all kinds of talents and skills are needed. Make a positive difference by putting your natural talents to work!

## TOP 10 REASONS TO GO GREEN IN 2012

6

### Tackle causes, not symptoms

Poverty, environmental damage and economic inequality are symptoms of complex, inter-related problems that sustainable development aims to address. Help combat the root causes of these multifaceted problems by getting involved!

7

### You are needed now more than ever

We hear stories every day of individuals, communities and nations negatively affected by unsustainable living patterns. There is no better time to act than now!

8

### You won't be alone

Sustainable development may be a relatively new field, but it is very popular. People of all backgrounds work and volunteer to keep the sector running and growing. Get involved now and meet like-minded young people, who play a huge part in the process!

9

### Freedom to be creative

It takes positive thinking and lots of imagination to raise awareness and take action on sustainable development issues. Do you aspire to be an inventor, entrepreneur, artist or activist? Promote sustainable development and stimulate your imagination!

10

### Fun and adventure

Who said saving the world couldn't be fun? Participate in massive stunts, join an online campaign or create art — all for a good cause. Get involved with sustainable development, and you'll work with some of the most dynamic and creative people on the planet. You'll be surprised by what can happen!

*Road to Rio+20 is a coalition of more than 60 partner organizations from around the world. It aims to motivate, inspire, engage and support young people to take action on issues of sustainable development, and influence the outcomes of the 2012 U.N. Conference on Sustainable Development (also known as Rio+20). Peace Child International is the coalition's coordinating partner.*

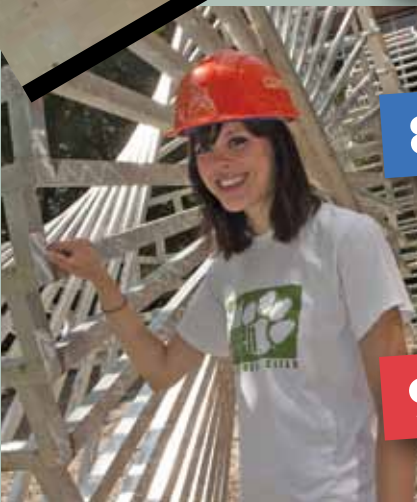
*The opinions expressed in this article do not necessarily reflect the views or policies of the U.S. government.*



Visit Road to Rio+20's website for more information about how you can get involved!  
<http://goo.gl/GhkVL>



Mathieu Soete



©AP Images/Ken Osburn

**Top:** Let's go! More than 100 young people gathered at the University on Youth and Development in Molina, Spain, to participate in the global 2011 Moving Planet Day campaign.  
**Above:** Get ready! A growing number of students, including Clemson University engineering student Jackie Blizzard, are preparing for careers in sustainable development.

# Have Something to Say?



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## Join the Conversation!

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**coming soon!**  
in *eJournal USA*

## Sports Strengthen Communities

Check out the upcoming issue of *eJournal USA* devoted entirely to sports!

Many young athletes dream of becoming superstars in their sport, but making big bucks in the big leagues is not what sports are all about. In the United States, sports play a major role in community life and teach valuable lessons such as discipline, teamwork and tolerance that help players succeed on and off the field.

